

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Group Art Unit: Unknown

Christoph Rüdinger et al.

Examiner: Unknown

Serial No.: Unknown
(U.S. National Phase of PCT/EP2004/013724)

Filed: Filed Herewith
(International Filing Date December 2, 2004)

For: METHOD FOR THE PRODUCTION
OF ISOCYANATOORGANOSILANES

Attorney Docket No.: WAS0742PUSA

PRELIMINARY AMENDMENT UNDER 37 C.F.R. § 1.115

MAIL STOP PCT
Commissioner for Patents
U.S. Patent & Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Following the filing of the application but prior to calculation of the filing fee and examination on the merits, kindly amend the application as follows.

Amendments to the Specification:

On page 1, after the title, insert the following new paragraph:

CROSS-REFERENCE TO RELATED APPLICATION

This application is the U.S. national phase of PCT Appln. No. PCT/EP2004/013724 filed December 2, 2004, which claims priority to German application 103 58 061.1 filed December 11, 2003.

At page 1, line 2, please add the following heading and subheading as shown below:

BACKGROUND OF THE INVENTION

1. Field of the Invention

At page 1, line 5, please add the following subheading as shown below:

2. Description of the Related Art

At page 2, line 13, please add the following heading as shown below:

SUMMARY OF THE INVENTION

At page 2, lines 14 and 18, please amend the paragraphs as shown below:

The object was therefore to provide a further process for preparing isocyanatoorganosilanes which solves the problems known from the prior art. ~~The~~ This and other objects ~~is~~ are achieved by ~~the~~ thermolysis of carbamatoorganosilanes ~~being~~ induced by exposure to microwave radiation.

At page 2, line 20, please add the following heading as shown below:

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

At page 3, at line 31, please amend the following paragraph as shown below:

As spacer **R¹** between the organosilyl group and the carbamato group, use can generally be made of linear or branched saturated or unsaturated C₁-C₆-hydrocarbon groups. Preferred spacers **R¹** are ~~alkyl~~ alkylene radicals, in particular linear ~~alkyl~~ alkylene radicals; ~~particularly~~ most preferably, use is made of methylene, ethylene and propylene.

At page 9, line 14, please amend the paragraph as shown below:

The inventive process is preferably carried out in a pressure range of ~~0.01-100~~ 0.01-100 bar, ~~particularly~~ more preferably at ~~0.5-40~~ 0.5-40 bar, in particular in a range of 1-10 bar.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Kindly cancel original claims 1 - 15 without prejudice, in favor of new claims 16 - 31.

Claims 1 - 15. (Cancelled)

16. (New). A process for preparing isocyanoatoorganosilanes by thermolysis of carbamatoorganosilanes, wherein the thermolysis takes place with exposure to microwave radiation.

17. (New) The process of claim 1, wherein isocyanoatoorganosilanes of the formula (1) are prepared



where

R is a monovalent C₁-C₁₀-alkyl radical,

R¹ is a divalent C₁-C₆-hydrocarbon radical and

R², R³ and R⁴ are in each case independently of one another, a methyl, ethyl, n-propyl, isopropyl, methoxy, ethoxy, n-propoxy or isopropoxy radical,

by thermolysis of carbamatoorganosilanes of the formula (2)



18. (New) The process of claim 16, wherein the thermolysis takes place in the presence of a catalyst.

19. (New) The process of claim 17, wherein the thermolysis takes place in the presence of a catalyst.

20. (New) The process of claim 18, wherein the catalyst is a homogeneous catalyst.

21. (New) The process of claim 20, wherein the catalyst comprises one or more compounds selected from the group consisting of soluble compounds of tin, lead, cadmium, antimony, bismuth, titanium, zirconium, niobium, iron, cobalt, manganese, chromium, molybdenum, tungsten, nickel, copper, zinc, and soluble organic nitrogen bases.

22. (New) The process of claim 20, wherein the catalyst comprises one or more compounds selected from the group consisting of 1,4-diazabicyclo[2.2.2]octane, dibutyltin dilaurate, dibutyltin maleate, dibutyltin diacetate and dimethyltin dichloride.

23. (New) The process of claim 18, wherein the catalyst is a heterogeneous catalyst.

24. (New) The process of claim 23, wherein the catalyst comprises a metal or compound thereof, the metal selected from the group consisting of Sn(I), Sn(II), Pb(II), Zn(II), Cu(I), Cu(II), Co(I), Co(II), Na, K, Li, Rb, Cs, Sr, Ba, Mg, Ca, Cr, Mo, Ti, V, W, Ce, Fe, Ni, Si, Al, Ge, Ga, In, Sc, Y, La and lanthanides, Pd, Pt, Co, Rh, Cu, Ag, Au, Zn, Cr, Mo, W, Cd, Fe, N, O, B, C, and mixtures and alloys containing the abovementioned elements.

25. (New) The process of claim 23, wherein the catalyst comprises at least one oxide, hydroxide, oxyhydroxide, mixed oxide, acetate, formate, oxalate, tartrate, citrate, nitrate, carbonate, or mixtures of the above-mentioned compounds, of one or more elements

selected from the group consisting of Sn(I), Sn(II), Pb(II), Zn(II), Cu(I), Cu(II), Co(I), Co(II), Na, K, Li, Rb, Cs, Sr, Ba, Mg, Ca, Cr, Mo, Ti, V, W, Ce, Fe, Ni, Si, Al, Ge, Ga, In, Sc, Y, La and lanthanides, Pd, Pt, Rh, Ag, Au and Cd.

26. (New) The process as claimed in claim 23, wherein the catalyst comprises one or more compounds selected from the group consisting of TiO_2 , ZrO_2 , HfO_2 , Al_2O_3 , BaO , CaO , MgO , CeO_2 , La_2O_3 , Y_2O_3 , Sm_2O_3 , Yb_2O_3 , Cr_2O_3 , ZnO , V_2O_4 , MnO_2 , NiO , In_2O_3 , Ga_2O_3 , GeO_2 , FeO , Fe_2O_3 , Fe_3O_4 , CuO , Co_3O_4 , $\text{Fe}(\text{MoO}_4)_3$, MgO/CsOH , MgO/NaOH , aluminosilicates, zeolites, cordierite of the composition $2\text{MgO} \cdot 2\text{Al}_2\text{O}_3 \cdot 5\text{SiO}_2$, heteropolyacids, carbon, transition metal nitrides, transition metal borides, transition metal silicides and carbides.

27. (New) The process of claim 23, wherein the catalysts are provided on a support.

28. (New) The process of claim 27, wherein as a catalyst support, an inert refractory material is employed.

29. (New) The process of claim 26, wherein as a catalyst support, oxidic and nonoxidic ceramics, SiO_2 , carbon, aluminosilicates, magnesium aluminosilicates or resistant metallic materials are used.

30. (New) The process of claim 26, wherein catalyst supports are in the form of irregular granules, spheres, rings, half-rings, saddles, cylinders, trilobes, or monoliths.

31. (New) The process of claim 16, wherein a gas-phase reactor containing a heterogeneous catalyst is located downstream of the microwave reaction chamber.

Amendments to the Abstract:

Kindly add the Abstract attached as a separate page hereto.

Remarks

The specification has been amended to incorporate United States Patent and Trademark Office recommended headings and subheadings, and to conform the specification to U.S. practice. The claims have been rewritten in U.S. format, eliminating multiple dependent claims. An Abstract has been added.

Early favorable consideration is respectfully requested

Respectfully submitted,
Christoph Rüdinger et al.

By: /William G. Conger/
William G. Conger
Reg. No. 31,209
Attorney/Agent for Applicant

Date: March 16, 2006

BROOKS KUSHMAN P.C.
1000 Town Center, 22nd Floor
Southfield, MI 48075-1238
Phone: 248-358-4400
Fax: 248-358-3351